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skilled and low valued work. Hence the normal course of development of the individual is gradual advancement from work of relatively low value to work of relatively high value.

The thing for workers to insist upon is that these opportunities for advancement to work of higher value, including advancement to all grades of executive work, be offered on the basis of proved merit rather than upon the basis of either favoritism or indefinite impression.

PRACTICAL PROCEDURE TO START RELATIVE RATING AT ONCE

Is it necessary to wait until all this analysis is completed in order to get a working basis for relative rating? We think not. The Franklin Motor Works used the rates for the various occupations that prevailed in 1905 as the basis of their relative rating. The rates of that year were chosen because those seemed to be the rates most

satisfactory to workers as evidenced by the low labor turnover rates of that year. From the viewpoint of workers this is probably the best index to the relative satisfactoriness of rates. If the rates of turnover are the same in the various occupations and operations or if they increase as we go downward from the highest valued operations, but increase gradually (for we hope that those in lower valued operations are less contented than those in the higher valued and seek to progress), this fact may be taken as indicating fair satisfactoriness of such rates.

Such a basis gives us a start. Then, if workers and employers accept the principle of relative rating and are willing to coöperate in putting it into operation, the work of analysis, rating, testing and correcting can start and proceed until in the course of time the data for more satisfactory relative rating accumulate and become practically available.

Wage Adjustment

By SANFORD E. THOMPSON

The Thompson and Lichtner Company, Consulting Engineers in Industrial Management and Construction

THE problem of wage adjustment must be considered from three angles and each of these three requires independent treatment:

1. General wage levels
2. Relative wages
3. Individual earnings

Wage levels, meaning the average earnings of large groups of workers, are governed not merely by laws of supply and demand and all of the variables incident thereto, but also by fluctuations in money values that are produced largely by causes outside the range of wage action.

Relative wages may be considered as the relative levels of earnings in

different operations in the same establishment and, in a broader sense, the relative levels in different localities and in different industries.

Finally, individual earnings should be determined by individual production. In these, more and more account is being taken—although this is often excluded in economic theories—of the ability of the particular shop or the particular industry to pay through natural causes, or the skill of the managerial organization to obtain with the coöperation of the worker, exceptional results.

At the present time it is the general wage level that is uppermost in the treatment of the problem of wages.

COST OF LIVING AND GENERAL WAGE LEVELS

Mr. Mitchell is correct in his conclusion that the actual cost of living cannot be used as a general basis for the fixing of wages, not only because the volume of wages must be governed by production, but also because the varying needs and different sizes of families prevent the fixing of a definite figure as a necessary requirement for earnings. The variation in budgets has been brought to the attention of the writer very forcefully in connection with recent arbitration proceedings.¹ At the same time, budgets of cost of living are useful incidentally in examining minimum wage-rates provided these are considered as real minimums and not, as is too frequent, average wages. They are also useful in comparing wage levels in different localities where living costs vary. In other words, data on cost of living may be considered as one of the factors to be used in adjusting the distribution of the returns to the workers, in preventing a too low minimum remuneration when the supply of workers is largely in excess of the demand, and, in fact, in considering the workers' share of the returns in cases where this is assumed to be the important element.

The increase or decrease in cost of living, on the other hand, provides definite information of distinct value in the adjustment of general wage levels. The cost of all products is chiefly a labor cost. Analysis of cost of building construction,² for example—although materials, such as lumber, brick cement, etc., average some 43 per cent of the total cost—shows labor as

87 per cent of this total building cost because the cost of the materials themselves so largely consists of labor. Other products show similar results. In fact, 80 to 95 per cent of the value of practically all products represents labor. For this reason the curve of the cost of living, made up as it is of the cost of various products, proportioned substantially on the basis of consumption, furnishes a guide to the trend of wages in the manufacture and distribution of these various products and, therefore, one of the bases for wage adjustment proportional to the cost of living prices.

Comparison of cost of living and wage curves over long periods shows the same general trend. The tendency of both is upward from year to year with extreme fluctuations only in such periods as that through which we are now passing, when conditions have been so abnormal. The upward slope of the wage curve should be greater than the upward slope of the cost of living curve because the increasing productive capacity of a man, due to improved machinery and methods and standardization, tends to raise wages and reduce costs, thus giving more and more margin for savings, luxuries and recreation.

SCIENTIFIC ANALYSIS AND RELATIVE EARNINGS

In thus considering the general aspects of the problem, however, the importance of scientific treatment of the features that affect relative earnings must not be minimized. Certain efforts, as Mr. Mitchell indicates, have already been expended along these lines with interesting results. One factor, labor turnover and its effect on the cost of training workers in the various branches of the shoe industry, has been investigated from a practical standpoint so as to provide a basis

¹ *The Rochester Shoe Wage Arbitration* presented before the American Society of Mechanical Engineers, December 6, 1921.

² See diagrams by the Thompson & Lichtner Co. in the *Boston Evening Transcript* May 21, 1921.

for the consideration of this particular element in this particular trade.³ In recent discussions with labor union officials the factors of training and skill have been brought out as elements in the determination of relative wages in the shoe industry. One of the most irritating features in this industry, in fact, to both the workers and manufacturers, are the uneven earnings due to lack of balance in the different departments, in some of which the workers earn relatively too little and in others, relatively too much. The unions at the present time are advocating analyses of fundamental conditions to get at the various factors which affect the relative and actual earnings. The necessity is evident, then, for studies such as are suggested by Mr. Mitchell, for more exact records of accomplishments, for laboratory experiments, and, particularly, for analyses in the shop which, after all, is the most effective laboratory. For this there must be greater coördination between industries and keener layout of the activities of the various manufacturers' associations not merely for investigating price fixing but for comparing methods, collecting facts, and analyzing conditions in the individual shops of the associations.

³ See "Assay on the Boot and Shoe Industry" by Sanford E. Thompson in *Waste in Industry* presented by the Federated American Engineering Societies.

THE FIXING OF THE INDIVIDUAL WAGE

The third division of the problem, the fixing of the individual wage, is as fundamentally important as the other two. Not until more definite standards of production are available, not until the manufacturers and workers alike realize more fully the need of intensive study, of job analysis, of the type of production control that eliminates the delays and idle time of man and machine, not until the wastes in the industry are recognized—and not merely recognized but attacked in scientific fashion—can we hope even to approach a solution of the wage problem. But we have this fact to prove to us the possibility of attaining the goal: certain plants, few to be sure, but representative, have attained notable results in their attempts to solve the wage problem. They have attained these results not through chance, not through fortunate conditions, not through superhuman efforts of a phenomenal executive, but through a study of causes, a presentation of facts and a derivation of standards. And these have been attained, moreover, not by the employer working as an autocrat of the old-fashioned school, but through the coördination and the coöperation of efforts of the employer and the worker.